

WHAT IS CLAIMED IS:

1 1. An organism characteristic data acquiring apparatus,
2 comprising:

3 a sampling section for sampling a partial image of
4 a portion of an organism;

5 a detection section for detecting, every time a
6 partial image is sampled by said sampling section, a
7 relative positional relationship between the partial image
8 and one of other partial images sampled already;

9 an extraction section for extracting, every time
10 a partial image is sampled by said sampling section,
11 characteristic portion data including characteristic
12 information unique to the organism portion from the partial
13 image; and

14 a synthesis section for synthesizing, every time
15 a partial image is sampled by said sampling section, the
16 characteristic portion data of the partial image extracted
17 by said extraction section and characteristic portion data
18 of the other partial image based on the relative positional
19 relationship of the partial image detected by said
20 detection section and outputting a result of the synthesis
21 as organism characteristic data of the portion of the
22 organism.

1 2. The organism characteristic data acquiring
2 apparatus as claimed in claim 1, wherein said sampling
3 section samples a partial image of a pattern formed from
4 ridge of the portion of the organism.

1 3. The organism characteristic data acquiring
2 apparatus as claimed in claim 2, wherein said extraction
3 section extracts, as the characteristic portion data,
4 information regarding a characteristic point of the ridge.

1 4. The organism characteristic data acquiring
2 apparatus as claimed in claim 3, wherein said extraction
3 section extracts, as the information regarding a
4 characteristic point of the ridge, at least one of a position,
5 a type and a direction of the characteristic point.

1 5. The organism characteristic data acquiring
2 apparatus as claimed in claim 3, wherein said extraction
3 section extracts, as the characteristic portion data, a
4 position of a sweat gland which exists on the ridge.

1 6. The organism characteristic data acquiring
2 apparatus as claimed in claim 3, wherein said extraction
3 section extracts, as the characteristic portion data, a
4 number of sweat glands which exist between the

5 characteristic points on the ridge.

1 7. The organism characteristic data acquiring
2 apparatus as claimed in claim 3, wherein said extraction
3 section extracts, as the characteristic portion data, a
4 position of a ridge end which is at an end of the partial
5 image.

1 8. The organism characteristic data acquiring
2 apparatus as claimed in claim 7, wherein said extraction
3 section extracts, as the characteristic portion data,
4 information of a connectional relationship between the
5 characteristic point and the ridge end.

1 9. An organism characteristic data acquiring apparatus,
2 comprising:

3 a sampling section for sampling a partial image of
4 a pattern formed from a ridge on a portion of an organism;

5 a detection section for detecting, every time a
6 partial image is sampled by said sampling section, a
7 relative positional relationship between the partial image
8 and one of other partial images sampled already;

9 an extraction section for extracting, every time
10 a partial image is sampled by said sampling section, ridge
11 structure data including characteristic information
12 unique to the organism portion from the partial image;
13 and

14 a synthesis section for synthesizing, every time
15 a partial image is sampled by said sampling section, the
16 ridge structure data of the partial image extracted by
17 said extraction section and ridge structure data of the
18 other partial image based on the relative positional
19 relationship of the partial image detected by said
20 detection section and outputting a result of the synthesis
21 as organism characteristic data of the portion of the
22 organism.

1 10. The organism characteristic data acquiring
2 apparatus as claimed in claim 9, wherein said extraction
3 section extracts, as the ridge structure data, a skeleton
4 line image obtained by thinning the image of the ridge.

1 11. The organism characteristic data acquiring
2 apparatus as claimed in claim 9, wherein said extraction
3 section extracts, as the ridge structure data, a binary
4 image obtained by binarizing the image of the ridge.

1 12. The organism characteristic data acquiring
2 apparatus as claimed in claim 2, wherein said detection
3 section detects, as the relative positional relationship,
4 a positional relationship of superposition between the
5 partial image and the other partial image such that ridges
6 same as each other in the partial image and the other partial
7 image are smoothly connected to each other.

1 13. The organism characteristic data acquiring
2 apparatus as claimed in claim 9, wherein said detection
3 section detects, as the relative positional relationship,
4 a positional relationship of superposition between the
5 partial image and the other partial image such that ridges
6 same as each other in the partial image and the other partial
7 image are smoothly connected to each other.

1 14. The organism characteristic data acquiring
2 apparatus as claimed in claim 2, wherein said detection
3 section detects, as the relative positional relationship,
4 a corresponding relationship of the ridges same as each
5 other in the partial image and the other partial image.

1 15. The organism characteristic data acquiring
2 apparatus as claimed in claim 9, wherein said detection
3 section detects, as the relative positional relationship,
4 a corresponding relationship of the ridges same as each
5 other in the partial image and the other partial image.

1 16. The organism characteristic data acquiring
2 apparatus as claimed in claim 1, wherein said sampling
3 section samples the partial image by replacing the organism
4 portion on a sampling face by a plural number of times
5 for sampling a partial image, and wherein

6 characteristic portion data regarding a partial
7 image, having an area which has a side shared by or overlaps
8 with at least one of the other partial images, from among
9 a plurality of partial images sampled by said sampling
10 section is used as an object of the synthesizing process
11 by said synthesis section.

1 17. The organism characteristic data acquiring
2 apparatus as claimed in claim 9, wherein said sampling
3 section samples the partial image by replacing the organism
4 portion on a sampling face by a plural number of times
5 for sampling a partial image, and wherein

6 characteristic portion data regarding a partial
7 image, having an area which has a side shared by or overlaps
8 with at least one of the other partial images, from among
9 a plurality of partial images sampled by said sampling
10 section is used as an object of the synthesizing process
11 by said synthesis section.

1 18. The organism characteristic data acquiring
2 apparatus as claimed in claim 1, wherein said sampling
3 section samples the partial image while the organism
4 portion is relatively moved with respect to a sampling
5 face for sampling a partial image, and wherein

6 characteristic portion data regarding a partial
7 image, having an area which has a side shared by or overlaps
8 with at least one of the other partial images, from among

9 a plurality of partial images sampled by said sampling
10 section is used as an object of the synthesizing process
11 by said synthesis section.

1 19. The organism characteristic data acquiring
2 apparatus as claimed in claim 9, wherein said sampling
3 section samples the partial image while the organism
4 portion is relatively moved with respect to a sampling
5 face for sampling a partial image, and wherein
6 characteristic portion data regarding a partial
7 image, having an area which has a side shared by or overlaps
8 with at least one of the other partial images, from among
9 a plurality of partial images sampled by said sampling
10 section is used as an object of the synthesizing process
11 by said synthesis section.

1 20. An authentication apparatus, comprising:
2 a sampling section for sampling a partial image of
3 a portion of an organism of an object person of
4 authentication;
5 a detection section for detecting, every time a
6 partial image is sampled by said sampling section, a
7 relative positional relationship between the partial image
8 and one of other partial images sampled already;
9 an extraction section for extracting, every time
10 a partial image is sampled by said sampling section,
11 characteristic portion data including characteristic

12 information unique to the organism portion from the partial
13 image;

14 a synthesis section for synthesizing, every time
15 a partial image is sampled by said sampling section, the
16 characteristic portion data of the partial image extracted
17 by said extraction section and characteristic portion data
18 of the other partial image based on the relative positional
19 relationship of the partial image detected by said
20 detection section and outputting a result of the synthesis
21 as organism characteristic data of the portion of the
22 organism; and

23 a collation section for executing a collation process
24 using the organism characteristic data from said synthesis
25 section in order to perform personal identification of
26 the object person of authentication.

1 21. An authentication apparatus, comprising:

2 a sampling section for sampling a partial image of
3 a pattern formed from a ridge on a portion of an organism
4 of an object person of authentication;

5 a detection section for detecting, every time a
6 partial image is sampled by said sampling section, a
7 relative positional relationship between the partial image
8 and one of other partial images sampled already;

9 a ridge structure data extraction section for
10 extracting, every time a partial image is sampled by said
11 sampling section, ridge structure data including

12 characteristic information unique to the organism portion
13 from the partial image;

14 a synthesis section for synthesizing, every time
15 a partial image is sampled by said sampling section, the
16 ridge structure data of the partial image extracted by
17 said ridge structure data extraction section and ridge
18 structure data of the other partial image based on the
19 relative positional relationship of the partial image
20 detected by said detection section and outputting a result
21 of the synthesis;

22 a characteristic data extraction section for
23 extracting characteristic data unique to the organism
24 portion from the result of the synthesis outputted from
25 said synthesis section; and

26 a collation section for executing a collation process
27 using the characteristic data extracted by said
28 characteristic data extraction section in order to perform
29 personal identification of the object person of
30 authentication.

1 22. An organism characteristic data acquiring method,
2 comprising:

3 a sampling step of sampling a partial image of a
4 portion of an organism;

5 a detection step of detecting, every time a partial
6 image is sampled at the sampling step, a relative positional
7 relationship between the partial image and one of other

8 partial images sampled already;

9 an extraction step of extracting, every time a

10 partial image is sampled at the sampling step,

11 characteristic portion data including characteristic

12 information unique to the organism portion from the partial

13 image; and

14 a synthesis step of synthesizing, every time a

15 partial image is sampled at the sampling step, the

16 characteristic portion data of the partial image extracted

17 at the extraction step and characteristic portion data

18 of the other partial image based on the relative positional

19 relationship of the partial image detected at the detection

20 step and outputting a result of the synthesis as organism

21 characteristic data of the portion of the organism.

1 23. An organism characteristic data acquiring method,

2 comprising:

3 a sampling step of sampling a partial image of a

4 pattern formed from a ridge on a portion of an organism;

5 a detection step of detecting, every time a partial

6 image is sampled at the sampling step, a relative positional

7 relationship between the partial image and one of other

8 partial images sampled already;

9 an extraction step of extracting, every time a

10 partial image is sampled at the sampling step, ridge

11 structure data including characteristic information

12 unique to the organism portion from the partial image;

13 and

14 a synthesis step of synthesizing, every time a
15 partial image is sampled at the sampling step, the ridge
16 structure data of the partial image extracted at the
17 extraction step and ridge structure data of the other
18 partial image based on the relative positional
19 relationship of the partial image detected at the detection
20 step and outputting a result of the synthesis as organism
21 characteristic data of the portion of the organism.

1 24. An organism characteristic data acquiring program
2 which causes a computer to function as:

3 a detection section for detecting, every time a
4 partial image is sampled by a sampling section for sampling
5 a partial image of a portion of an organism, a relative
6 positional relationship between the partial image and one
7 of other partial images sampled already;

8 an extraction section for extracting, every time
9 a partial image is sampled by said sampling section,
10 characteristic portion data including characteristic
11 information unique to the organism portion from the partial
12 image; and

13 a synthesis section for synthesizing, every time
14 a partial image is sampled by said sampling section, the
15 characteristic portion data of the partial image extracted
16 by said extraction section and characteristic portion data
17 of the other partial image based on the relative positional

18 relationship of the partial image detected by said
19 detection section and outputting a result of the synthesis
20 as organism characteristic data of the portion of the
21 organism.

1 25. An organism characteristic data acquiring program
2 which causes a computer to function as:

3 a detection section for detecting, every time a
4 partial image is sampled by a sampling section for sampling
5 a partial image of a pattern formed from a ridge on a portion
6 of an organism, a relative positional relationship between
7 the partial image and one of other partial images sampled
8 already;

9 an extraction section for extracting, every time
10 a partial image is sampled by said sampling section, ridge
11 structure data including characteristic information
12 unique to the organism portion from the partial image;
13 and

14 a synthesis section for synthesizing, every time
15 a partial image is sampled by said sampling section, the
16 ridge structure data of the partial image extracted by
17 said extraction section and ridge structure data of the
18 other partial image based on the relative positional
19 relationship of the partial image detected by said
20 detection section and outputting a result of the synthesis
21 as organism characteristic data of the portion of the
22 organism.

1 26. A computer-readable recording medium on which an
2 organismcharacteristic data acquiring program is recorded,
3 said program causing a computer to function as:

4 a detection section for detecting, every time a
5 partial image is sampled by a sampling section for sampling
6 a partial image of a portion of an organism, a relative
7 positional relationship between the partial image and one
8 of other partial images sampled already;

9 an extraction section for extracting, every time
10 a partial image is sampled by said sampling section,
11 characteristic portion data including characteristic
12 information unique to the organismportion from the partial
13 image; and

14 a synthesis section for synthesizing, every time
15 a partial image is sampled by said sampling section, the
16 characteristic portion data of the partial image extracted
17 by said extraction section and characteristic portion data
18 of the other partial image based on the relative positional
19 relationship of the partial image detected by said
20 detection section and outputting a result of the synthesis
21 as organism characteristic data of the portion of the
22 organism.

1 27. A computer-readable recording medium on which an
2 organismcharacteristic data acquiring program is recorded,
3 said program causing a computer to function as:

4 a detection section for detecting, every time a

5 partial image is sampled by a sampling section for sampling
6 a partial image of a pattern formed from a ridge on a portion
7 of an organism, a relative positional relationship between
8 the partial image and one of other partial images sampled
9 already;

10 an extraction section for extracting, every time
11 a partial image is sampled by said sampling section, ridge
12 structure data including characteristic information
13 unique to the organism portion from the partial image;
14 and

15 a synthesis section for synthesizing, every time
16 a partial image is sampled by said sampling section, the
17 ridge structure data of the partial image extracted by
18 said extraction section and ridge structure data of the
19 other partial image based on the relative positional
20 relationship of the partial image detected by said
21 detection section and outputting a result of the synthesis
22 as organism characteristic data of the portion of the
23 organism.